Submitted to the Academic track of the
Third European Conference on Organizational Knowledge, Learning and Capabilities,
Athens, Greece, 5-6 April 2002.

Learning from MIS-ventures: MIS Research as a Narrative Web

by

John Monin and Nanette Monin

Department of Management & International Business

Massey University, Albany Campus

Auckland NEW ZEALAND

Email: D.Monin@massey.ac.nz

Email: N.Monin@massey.ac.nz

Learning from MIS-ventures: MIS Research as a Narrative Web

Abstract

It is acknowledged that MIS knowledge has always resided in conceptualizing and developing applications in the context of 'explicit' and well defined knowledge. In this paper, however, we contend that the less tangible aspect of knowledge, 'tacit' knowledge, is now the area that demands more attention from MIS researchers and academics. Tacit knowledge provides the organizational context for MIS implementation. MIS researchers need to recognize practitioners' skills in utilizing tacit knowledge in their organizational workplace if they are to successfully contextualize the explicit and tacit knowledge that is inherent in practitioner technical know-how.

The historical narrative of the MIS discipline, as told by our published academic papers, lacks the tacit knowledge that intensive research could reveal. It particularly lacks the tacit knowledge that stories of mis-takes and mis-adventures could provide.

In order to support our claim, we inspected three influential, highly ranked journals over a 5-year period.

The results of our analysis reveal a lack of balance in the worldview of MIS academics. Most articles are premised on positive outcomes and utopian stories of success.

Introduction

The aim of this paper is to explore whether the management information systems (MIS) academic literature adequately analyses and reports upon the complex nature of knowledge acquisition and learning. Our particular epistemological perspective is based in narratology, for we posit that many tacit aspects of knowledge are best represented in the capture, re-telling and interpretation of narratives. Furthermore, when we read the extant body of our own MIS theory as a complex web of narrative, then we discover that it is an incomplete narrative: as we read it our theory is the construct of positivists who promote ever newer and better ways of operationalizing the explicit knowledge that emerges from positivist explorations, while discarding the

tacit knowledge discoverable in experiential tales of mis-adventure, mis-takes, and mis-haps. Most of such examples of narrative in the MIS literature would come from the recounting of stories in the form of case studies.

We argue that because MIS research has not, to date, developed a critical self-awareness of its own history, it therefore lacks a potentially valuable dimension of disciplinary knowledge. We argue that the learning of both foundational and contemporary theorists provides support for our contention that the acquisition and development of disciplinary knowledge as an historical narrative should be a multi-faceted, all-encompassing enterprise. In classical learning the historian was regarded as a guardian of positivist 'facts' for 'historia' in Latin is derived from the Greek *historia* meaning 'knowledge obtained by inquiry'; and yet because the rich complexity of the concept of 'knowledge obtained by inquiry' is also captured by another Greek word, *histos*, that links history and story to the idea of weaving (cloth, sheets or sails), and hence to a 'web', we maintain that knowledge is best understood as a complex play of diverse inter-textual constructs. In a play of meaning that echoes on through modern French, Italian and English, the words for 'text', derived from the weaving metaphor of the ancient Greeks, is picked up in the critical theory of postmodernism (Barthes, 1982)

This historical derivation of the linkage between textual knowledge in MIS theory as a history and as a narrative, woven by plurivocal, diverse texts is essential to our interpretation of contemporary representations of knowledge in the applied arena of knowledge management: for we suggest that the published historical narrative of our theory excludes the experiential story of much workplace knowledge, particularly the knowledge-cum-wisdom that is gleaned from mistakes, inadequacies, and deficiencies. The role that this untold story could fulfill is revealed in the difficulties we experience when we attempt to codify and encapsulate the experiential, more intuitive understandings of experts within organizations. As an example, the promised advances in artificial intelligence (AI) have not come to fruition, despite two decades of research into, first 'expert', and then 'knowledge' systems.

Traditionally, knowledge development and dissemination in MIS has tended to depend upon *explicit* informational data gathering, rather than on the more intangible,

and in the longer term perhaps more valuable, asset of *tacit* knowledge acquisition (Grover & Davenport, 2001; von Krogh, Ichijo, & Nonaka, 2000). Tacit knowledge knowledge that is understood, but not stated (etymologically linked to the Latin *tacitus* 'passed over in silence, concealed' from *tacere* 'to be silent), is commonly placed in apposition with explicit knowledge, knowledge that is 'spread out, well ordered, regular (Lt. *explicatus*).

Because capturing the tacit knowledge embedded in organizational memory, rituals, beliefs, aspirations and identity in the form of narrative pantextuality is not well suited to computer science techniques based on statistical and probabilistic methods, the cognitive revolution that began in the late 1950s (Bruner, 1990, pp.1-5) ensured an early shift from:

> "meaning" to "information", from the *construction* of meaning to the *processing* of information … profoundly different matters (Brunner, 1990, p.4)

But processing information is not the challenge we now face: knowledge development is dependent on our ability to store, convey and retrieve the illusive yet knowledge-rich narratives of experiential comprehension, learning, and competence (Brown & Duguid, 2000). Moreover Tsoukas & Vladimirou, as an aside in their acknowledgement of our debt to Polanyi for his distinction between tacit and explicit knowledge, point out the academic community's lack of debate on Polanyi's contention that '..since all knowledge has its tacit presuppositions, tacit knowledge is not something that can be converted into explicit knowledge..' (Tsoukas & Vladimirou, 2001, p. 975). This axiom may help explain why IS solutions struggle unsuccessfully to convert much of our organizational knowledge into computerized systems.

Although we acknowledge the debate that contests the meaning of 'organizational knowledge' as actualized in the workplace, we do not choose to enter into it. Rather we accept the definition of 'organizational knowledge' proffered by Tsoukas & Vladimirou: *knowledge is the individual ability to draw distinctions within a collective domain of action, based on an appreciation of context or theory, or both*

(2001, p. 979). There is no reference in this definition to tangible assets such as databases or repositories of information, and yet many MIS authors continue to fail to make the distinction between data-cum-information (explicit knowledge) and knowledge-cum-wisdom (tacit knowledge).

We argue that the developers of technological systems need to recognize ambiguity, blurred boundaries and multiple interpretations, as they endeavour to understand and link the inter-weavings of humans and machines, the individual and communal, the theoretical and practical, the past and present.

The academic *theory* of MIS (if we accept that it is premised on organizational knowledge as defined above) is a distillation of knowledge learnt in the past: 'the general laws or principles established by observation and experiment' (Onions, p. 2281). This is the history or, as we read it, the narrative of our knowledge, tacit and explicit. In an organizational context the theorizing that takes place, while perhaps not academic, is still contemplative and involves the act of sensemaking in the context of action. Karl Weick quotes Ryle (1949) who distinguishes between theory and practice by defining the former as 'knowledge that' and the latter as "the more tacit 'knowledge how'" (Weick, 1995, p. 123). So both types of knowledge, the more explicit theory-based and the more tacit practice-based are intertwined, but they are also both products of historical learning.

Knowledge as a Narrative Web
We argue that organizational knowledge should be re-conceptualized and researched as a mythic *Wundermärchen* (Propp, 1968): an historical story, woven from our inquiries into not only the hero managers and success models already familiar in our theories, but also a story that also learns from examples of the failures, mis-ventures, and machinatory management practices that could emerge from the institutionalized practice and theory of the past. We argue that knowledge develops out of, and is built on, honest historical inquiry that recognizes, in the questions we ask, and the routes we propose as we build 'new' theories, aspects of the fallibility, incompetence, and tunnel vision that dog all our models of 'the way we do, or should do, things around here'.

The acquisition of sound tacit knowledge must depend on learning in the context of both success and failure. Such experience can be captured and re-told in the form of stories or narratives of various genres. The Latin words *gnarus*, meaning 'knowing', and *narrare*, meaning 'to tell' are related, and neatly encapsulate the notion of relating the experience of acquiring knowledge.

The fairy tale is just one example of a traditional time-honored genre of story. Its persistent existence relies on the audience's recognition of a balanced worldview of the narrator/author. But many a modern guru writer has chosen to flout the conventions of the genre. Blanchard and Johnson in their bestseller, *The One Minute Manager* (1994) portray, in the form of a fairy tale, a learning process for a successful management trainee. An analysis of their book against the theoretical framework of Propp's extensive analysis of Russian fairy tales shows that, unlike the 'hero' in the classic fairy tale, the trainee manager in the book is not exposed to any negative hurdles on the road to his successful career (Monin & Monin, 2001b).

Our proposition in this paper is that MIS researchers and academics are guilty of a similar lack of balance in their research activities. It may be one reason why many practitioners fail to recognize the relevance of much of the research findings published by our MIS journals.

Because stories are an important component of any body of knowledge we argue that the complexity of multi-voiced historical organizational knowledge can best be conceptualized as a 'narrative web'. In organizational inquiry stories are already recognized as providing valuable qualitative data (Davenport & Prusak, 2000; Gabriel, 2000; Johnson, 2000; Martin, 1982): in the environment of MIS they gain additional significance as an active manifestation of the tacit, as distinct from explicit elements of knowledge (Monin & Monin, 2001a).

The majority of organizational stories collected by Yiannis Gabriel are computer-related (Gabriel, 2000, p. 148) – of the 13 'favourite' themes identified approximately 25% of all cases involve computers, and the number of instances occurred 3 times more often than the next most favourite theme of 'leaders'. Gabriel suggests that even though the stories in his database are too short to 'combine the emotional, symbolic,

and narrative complexities .. to be comparable with folk tales and fairy stories .. the stories provide a fascinating window onto a wide range of emotions' (p.149). While some might argue that the stories Gabriel collected do not, without careful interpretive analysis and comment, constitute a readily accessible store of explicit organizational knowledge, we would counter that their import as cues to, or indicators of, such matters as organizational health, employee morale, or client satisfaction, provide us with paths to valuable tacit knowledge.

Gabriel himself reminds us that in some stories the codification of the type of emotion is a question of interpretation: 'Different readers, reading the same story will read different emotional nuances in the text..' (p. 150). We recognize this, but also insist that unless our knowledge systems can accommodate the possibility of multiple interpretations, we are not effectively capturing essential tacit organizational knowledge.

We also found Gabriel's categorization of tone in these stories interesting; and have regrouped the emotional tones he distinguished into a binary division of positive and negative groupings (see Table 1).

Table 1: Emotional Tone of Gabriel's Stories

Positive		**Negative**	
Amusement	114	Disparagement	82
Pride	70	Disapproval	57
Relief	20	Anger	19
Satisfaction	15	Pity	19
Affection	14	Reproach	17
Nostalgia	14	Sadness	17
Approval	14	Frustration	14
Admiration	10	Derision	13
Fun	6	Worry	13
Diversion	9	Bitterness	12
		Horror	11
		Disappointment	9
		Panic	9
		Irony	8
		Mockery	7
		Anxiety	6
		Guilt	6
		Scorn	6
		Self-disparagement	6
Totals	**286**		**331**
	(46.35%)		**(53.65%)**

Source: based on Gabriel, 2000, p. 149.

The table demonstrates that in these rather simple stories, most of which do not exceed 300 words, the negative emotional tone is more dominant than the positive and of greater variety. In marked contrast to the hype of IS guru literature (Monin & Monin, 1999) or the utopian claims of IS proponents (Kling, 1996; Monin, 1999), there is a sense here of complex, problematic organizational contexts. It is this multifaceted blend of the good and the bad, of action and emotion, motive and outcome, of effective, frustrating, diverting, disappointing, worrying and sometimes even satisfying organizational experience as portrayed in narratives that we present as a largely yet-to-be-mined store of tacit MIS knowledge.

We have demonstrated that two genres of narrative – the informal organizational story and the genre-based fairy story – represent a realistic balance of the positive and negative outcomes of organizational experience that is part of knowledge making. We also suggest that Gabriel's analysis and conclusions point to the reservoir of tacit knowledge that we might expect to find mirrored in our academic research. We now turn now to the academic literature of MIS and ask whether our discipline is seeking out the tacit knowledge, the diversity and complexity inherent in tacit knowledge, that our narratives could convey.

The Research Question

Our paper posits three interwoven questions: do the case studies and/or empirical examples provided by academic authors in the MIS journals represent 'real-world' experience? Do the practice-based exempla highlight principles that emerge from the positivist constructions of explicit theory-building? Is the theory itself predicated upon utopian outcomes?

Method

In order to test the proposition that academics in IS have not yet sufficiently taken heed of the current research emphasis on the need to recognize the importance of tacit knowledge, we selected three highly ranked MIS journals for analysis. We were particularly interested in discovering whether or not the papers published in these journals would portray anything of the tacit knowledge that can be gleaned from

narratives of mis-ventures. The journals *MIS Quarterly* (MISQ), *Information Systems Research* (ISR), and *Journal of Management Information Systems* (JMIS) were selected from the MIS journal rankings publicized by the Association for Information Systems (http:/www.isworld.org). These three journals are the most highly ranked that contained either 'IS' or 'MIS' in their title.

The analysis involves inspection of the contents of papers published over a period of five years: 1996 - 2000. However, because JMIS has more papers per issue, we chose three years' data: 1998/99 - 2000/01. Our sample, a total of 287 papers, is composed of 80 (MISQ), 108 (ISR) and 99 (JMIS). For MISQ, only articles appearing in the 'Theory and Research' and 'Application' are considered.

The objectives of the content analysis of the academic texts are threefold:
1. to inspect the paper titles for any hint of a 'story not-told';
2. to search for methods of analysis that are non-explicit;
3. to comment on other elements of tacit knowledge.

In conducting this search and analysis we built on the work of Lee, Barua & Whinston (1997) who undertook a similar analysis though with a different end in view. They looked at research methods that contained causal relationships, and for their sample they chose MIS articles for the period 1989 - 1995 - a total of 307 papers. Their aim, a response to criticisms of the standard of research in the discipline, was to 'examine the current status of field research in MIS'. Their implicit assumption was that all the papers are in the positivist, causal category of research methodologies. We have refined their classification in order to include interpretive/phenomenological methodologies.

Their classification bifurcates all papers into non-empirical and empirical. Non-empirical includes 'technical' and a second unspecified category that we have labeled 'theory'. In the technical sub-category we have included research methods, technical issues and simulations or modeling (accounting, economic, financial). We have placed conceptualization and references to 'framework' in the sub-category 'theory'.

In the empirical category Lee *et al.* identify three sub-categories of research methods: case studies, experimental and field. Field studies they further sub-divide into 'causal' and 'non-causal'. They regard 'instrument development' and 'survey' methods as *non-causal* field studies. We differ: we maintain that both of these methods can be either causal or non-causal depending upon the epistemological intent of the researcher. As an example, we found a number of articles that report the validation process to develop instruments that are designed to confirm a causal hypothesis.

Lee *et al.* fully intended to include our third category, but

> While *interpretive* studies based on "post-positivistic" or other recommended paradigmatic shifts such as action research ...and phenomenological research ... are crucial in generating a deeper understanding of phenomena of interest, such studies were not found in the sample. This observation is consistent with earlier findings that 96.8% of publications between 1983 and 1988 were positivist in nature ... Of course, if the sample had included European journals, we would expect to observe studies in the above categories. (p. 115)

It should be pointed out that direct comparisons between our sample and that of Lee *et al.* is not possible, because in place of JMIS their sample comprises MIS articles from *Management Science*, *Decision Sciences*, and *Organization Science*.

For the third major category that represents the non-positivist, we prefer Karl Weick's term 'intensive' (Weick, 1994). It encapsulates the tenor of qualitative research, that is, the indepth, rich analysis that is necessary to understand the complexity of situated data. Such complexity must include 'negativist' interpretation, such as cases of failure. The positivist story of success, imbedded in explicit knowledge, ignores the tacit knowledge that arises out of an historical accumulation of learning from experiencing both positive and negative outcomes. The editorial comment in MISQ "that we might better succeed by seeking stability in *information systems lessons* rather than in *information technologies*." (March, 2000, p. v.) hints at a similar need for academic research recognition of practitioner memory.

We postulate that if we are to find instances of tacit knowledge-making in our academic literature it is more likely to occur in the category of 'intensive'.

The concept of historicity as a part of intensive methods needs further elaboration. Time series analysis and longitudinal studies are examples of the use of retrospective data in positivist research. In a related sense, all researchers commence their publication with a literature review of previous (historical?) publications. But in intensive research it is the (hi)story that is the framework for the narrative unfolding in the field study.

Mason, McKenney & Copeland (1997a) point out that the MIS field 'has generally lacked an historical perspective' (p.258) and they cite Joseph Schumpeter who posited that all mature disciplines require a study of history to provide context for their on-going research and knowledge acquisition. To illustrate their point they included a 'case history' in the same issue of MISQ (Mason, McKenney & Copeland, 1997b).

Analysis

The numerical results of the codifying of the data are summarized in Appendix 1. The labels for the coding scheme are in the a) section of the table that also contains the overall totals for each category. The first letter of the code (A, B or C) refers to the primary classifications of Non-empirical, Empirical and Intensive respectively. The subsequent sub-categories are self-explanatory, and are based on the discussion above. Articles using multiple research methods are classified according to the method most central to their research.

In the first category of Aa, the technical issues cover such themes as economic value, re-engineering, costing and pricing models, database retrieval techniques, diffusion. This category also includes research methods, but only one article is specifically devoted to intensive methods (Klein & Myers, 1999). The MISQ has only 3 articles in this category out of 81, whereas a third of ISR's 108 articles have this technical/methodology orientation. Overall this is the largest category.

We were surprised to find the relatively low number of 'theory' papers (Ab) - only 11.85% of all articles, and these are evenly spread over the three journals.

Approximately the same percentage (11.15%) of articles fall into the next two categories that make up of empirical case studies (Ba, Bb). MISQ contains just over half (18) of all articles that adopt this method. During the codifying process we differentiated between the levels of richness in the case study. Most examples were single case 'sites' and case histories rather than indepth multiple cases. The latter are candidates for the intensive category. It is here that we find the authors discussing complexity, variety (2), and the title contains the words 'lessons' (3 in MISQ) and 'learning'. But as can be seen by the numbers, only 11 of the 32 fall into the category of intensive methods.

In the field of MIS the psychologically based method of the controlled experiment (Bb) is very popular, and seems to be the most appropriate in the area of human-computer interface (HCI) and group decision support systems (GDSS). This category is the second most popular, attracting over 18% of all articles, and these are quite evenly spread over the three journals.

Almost as popular as the experimental method is the causal field study (Bc2), where the instrument is commonly a survey. Path analysis, and semi-structured interviews are also used, and a very popular method is protocol analysis. Almost 25% of all MISQ articles are in this category.

The category of 'non-causal' field studies (less than 10% of the total) is reserved for the more descriptive surveys that are part of exploratory studies that do not propose causal hypotheses.

The only remaining category, that of 'intensive' is the smallest. But if we add the 11 occurrences of intensive case studies, we raise the proportion to 12.54%. In the C-category, 15 of the 25 papers (numbers in brackets) have been saved up for special issues: JMIS in 1999,Vol.15, No. 3 (2) 'GSS Insights: A look back at the Lab' – we noted the historical perspective; and MISQ in 1999/2000 Vol. 23, No. 1 and Vol. 24, Nos. 1 & 3, specifically addresses 'intensive research in information systems' (6); ISR in 1996 (7).

The ISR special issue contains articles that critique the current notion that organizational transformation is rapid, and use 'different methodological lenses'. The methods range from two historical case studies, dramaturgy, and an interpretive approach that focuses on socially constructed meanings. One paper that takes an ethnographic approach centers on a failure of IT transformation (Star & Ruhleder, 1996). The other two journals, in their special issues, include examples of action research (3), grounded theory, another ethnographic account, symbolism, participant observation, intensive interviews, and a 'revealed causal mapping approach' (Nelson *et al.*, 2000).

The question that begs an answer is: why do the IS editors in our sample find it necessary to segregate papers with intensive methods into special issues?

The papers not in the special issues, but still with intensive techniques, display more examples of grounded theory, participant observation, intensive interviews, and an historical analysis. More unusual is a cluster analysis of 514 communication incidents (Carlson & Davis, 1998), the use of repertory grids in a cross-cultural topic, and another analysis of failure (Kumar, van Dissel & Bielli, 1998).

Conclusions

In order to answer the research question, we need to concentrate on the empirical studies represented by approximately 65% of our sample (or 186 articles). We asked how balanced is the worldview they assume? Do the exempla profiled by our academics reflect a balanced account of the real organizational context? We would expect to see our propositions grounded in, and cognizant of the complexity, variety and ambiguity of contemporary business environments. Such environments presume risk taking, positive and negative cycles of viability and numerous episodes of failure.

Our sample has only three articles that set out to analyze examples of antithetical failure. The large majority of articles presume positive outcomes and adopt positivist research methods by - which tautologically implies an *a priori* utopian worldview of enduring success. Only the articles that adopt an intensive methodological approach tend to exhibit a more humble 'realistic' acceptance of shortcomings in our

knowledge. Lessons have to be learnt if we are to overcome those shortcomings and limitations in our explicit knowledge.

Our survey of the literature published by three highly ranked MIS journals, indicates that the discipline almost always focuses on models of 'how to', and seldom on 'how not to'. Ironically, even where there has been qualitative inquiry, it has tended to feed into this affirmative (and in a further twist, non-realistic) modeling of future success.

We conclude that if future research were to include narratives of honest reflection on our historical theory and practice, development of our disciplinary knowledge would be enabled.

References

Barthes, R. (1982). Introduction to the structural analysis of narratives. In S. Sontag (Ed.), *A Barthes reader* (pp. 251-295). New York: Hill and Wang.

Brown, J.S. & Duguid, P. (2000). *The social life of information*. Boston, MA: Harvard Business School Press, 124ff.

Blanchard, K. & Johnson, S. (1994). *The one minute manager*. London: HarperCollins.

Bruner, J. (1991). The narrative construction of reality. *Critical Inquiry, 18*, 1-6.

Carlson, P.J. & Davis, G.B. (1998). An investigation of media selection among directors and managers: From 'self' to 'other' orientation. *MIS Quarterly*, 22, (3), 335-362.

Davenport T.H. & Prusak, L. (2000). *Working knowledge*. Boston, MA: Harvard Business School Press.

Gabriel, Y. (2000). Storytelling in organizations: Facts, fictions, and fantasies. Oxford: Oxford University Press.

Grover, V. & Davenport, T.H. (2001). General perspectives on knowledge management: fostering a research agenda. *Journal of Management Information Systems, 18* (1) 5-22.

Klein, H. K. & Myers, M.D. (1999). A set of principles for conducting and evaluating interpretive field studies in information systems. *MIS Quarterly*, 23, (1), 67-94.

Kling, R. (1996). Hopes and horrors: Technological utopianism and anti-utopianism in narratives of computerization. In Kling, R. (Ed.) *Computerization and*

controversy: Value conflicts and social choices (2nd ed.). San Diego: Academic Press.

Kumar, K., van Dissel, H.G. & Bielli, P. (1998). The merchant of Prato - *revisited*: Toward a third rationality of information systems. *MIS Quarterly*, 22, (2), 199-226.

Mason, R.O., McKenney, J.L. & Copeland, D.G. (1997a). Developing an historical tradition in MIS research. *MIS Quarterly*, 21, (3), 257-278.

Mason, R.O., McKenney, J.L. & Copeland, D.G. (1997b). Bank of America: The crest and trough of technological leadership. *MIS Quarterly*, 21, (3), 321-358.

Martin, J. (1982). Stories and scripts in organizational settings. In A.H. Hastorf & A.M. Isen (Eds.) *Cognitive social psychology*. North-Holland: Elsevier.

Monin, J. & Monin, N. (2001a). The rape of the machine metaphor. In W. Smith, M. Higgins, M. Parker & G. Lightfoot (Eds.) *Science fiction and organization* (pp.61-72). London: Routledge.

Monin, N. & Monin, D.J. (2001b). *Once upon a Time ... there was a One Minute Manager: A structuralist analysis of a fairy tale.* Presented at the 13th ANZAM International Conference: 'Closing the Divide', 5-7 December, Auckland, New Zealand.

Monin, D.J. (1999). Business technology and society: Utopia and the revenge of IT. In N. Monin, D.J. Monin and R. Walker (Eds.) *Narratives of business and society in New Zealand: Differing voices*. Auckland: Addison Wesley Longman.

Monin, D.J. & Monin, N. (1999). Technological utopia or fin de siècle despair? A rhetorical analysis of three guru texts. *5th International Conference of the Decision Sciences Institute,* Athens, Greece, July 4-7.

Nelson, K.M., Nadkarni, S., Narayanan, V.K. & Ghods, M. (2000). Understanding software operations support expertise: revealed causal mapping approach. *MIS Quarterly*, 24, (3), 475-508.

Onions, C.T. (Ed.) (1973). *The shorter Oxford English dictionary*. Oxford: Clarendon Press.

Propp, V. (1968). *Morphology of the folktale* (2nd ed.) (L. Scott, Trans.). Austin: University of Texas Press.

Ryle, G. (1949). *The concept of the mind*. Chicago: University of Chicago Press.

Star, L.S. & Ruhleder, K. (1996). Steps toward an ecology of infrastructure: Design and access for large information spaces. *Information Systems Research*, 7, (1), 111-136.

Tsoukas, H. & Vladimirou, E. (2001) What is organizational knowledge? *Journal of Management Studies*, 38, 7, 973-993.

Von Krogh, G., Ichijo, K & Nonaka, I. (2000). *Enabling knowledge creation: how to unlock the mystery of tacit knowledge and release the power of innovation*. Oxford: Oxford University Press, 27ff.

Weick, K.E. (1994). Theoretical assumptions and research methodgy selection. In F.W. McFarlan (ed.) *The information systems research challenge* (p115). Boston, MA: Harvard Business School Press.

Weick, K.E. (1995) *Sensemaking in organizations*. Thousand Oaks, CA: Sage Publications.

Appendix 1

a)

Code		Totals	%
Aa	Non-empirical: technical	67	23.34
Ab	Non-empirical: theory	34	11.85
Ba1	Empirical: case studies	21	7.32
Ba2	Empirical: case studies – intensive	11	3.83
Bb	Empirical: experimental	53	18.47
Bc1	Empirical: field - non-causal	27	9.41
Bc2	Empirical: field – causal	49	17.07
C	Intensive	25	8.71
		287	**100.00**

b)

MISQ	1996	1997	1998	1999	2000	Totals
Aa	1		1	1		3
Ab	2	4	1	1	2	10
Ba1				8	2	10
Ba2	3		4		1	8
Bb	3	2		4	3	12
Bc1	3	2	1	1		7
Bc2	4	1	6	2	7	20
C	1		3	1	5	10
						80

c)

ISR	1996	1997	1998	1999	2000	Totals
Aa	5	8	8	5	10	36
Ab	2	1	4	3	2	12
Ba1	1	1	1			3
Ba2		1	1			2
Bb	8	4	3	4	5	24
Bc1	1	2	1	5		9
Bc2	1	4	3	2	3	13
C	7				2	9
						108

d)

JMIS	1998/99	1999/00	2000/01	Totals
Aa	6	13	9	28
Ab	2	4	6	12
Ba	11	3	4	8
Ba2	1			1
Bb	8	3	6	17
Bc1	3	4	4	11
Bc2	7	5	4	16
C	2	2	2	6
				99